UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO
09/558,003	04/24/2000	Toshikazu Hori	SS-722-07	7687

7590 07/20/2004

Law Offices of Thomas E Schatzel
A Professional Corporation
Suite 240
16400 Lark Avenue
Los Gatos, CA 95032-2547

EXAMINER	
JERABEK, KELLY L	

ART UNIT	PAPER NUMBER
2612	5

DATE MAILED: 07/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/558,003	HORI ET AL.	
	Examiner	Art Unit	
	Kelly L. Jerabek	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,3,5 and 12-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,3,5 and 12-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 2, 3, 5, and 12-16 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tran.

Re claim 13, Tran discloses in figure 1 and imaging system (10) that is part of a video camera system (col. 3, lines 34-36). The imaging system (10) includes a sensor subsystem (12) that can include a CCD to provide a video output (col. 3, line 59 – col. 4,

line 12). It is inherent that CCDs have a light-exposure-to-analog conversion dynamic range characteristic. An electrical image signal (22) received from the sensor subsystem (12) is sent to an A/D converter in order to convert the analog electrical image signal (22) outputted from the sensor subsystem (12) to a digital representation (col. 5, lines 1-9). The examiner takes Official Notice that it is well known in the art that A/D converters have an analog-to-digital conversion dynamic range and that the full analog dynamic range of the imaging device makes use of the full digital output word range of the A/D converter. It would have been obvious to one of ordinary skill in the art at the time of invention for the imaging system of Tran to include an A/D converter that includes an analog-to-digital conversion dynamic range and that the full analog dynamic range makes use of the full digital output word range of the A/D converter. Tran also states that digital values are modified within the subsystem (14) based on a gain profile that is stored in the subsystem (14) (col. 7, lines 7-10). The gain profile is selected to achieve a transfer function (fig. 6). It can be seen in figure 6 that there are different digital transfer functions according to the different regions (A,B,C). A lookup table approach is used where each digital value input into the subsystem (14) is replaced by a value stored in a lookup table memory location corresponding to the digital value (col. 7, lines 10-15). Therefore, a lookup table is connected to convert digital video output words of the A/D converter and each word is converted according to one of the digital transfer functions of figure 6 corresponding to the different regions (A,B,C). The transfer function has three different regions (A,B,C) corresponding to a different input image intensity range (col. 6, lines 7-29). The three different regions of the transfer

function can be treated as three different transfer functions. A low dynamic range input signal will be confined to region A of the transfer function, a medium dynamic range input signal will be processed by both region A and region B, and a high dynamic range input signal will be processed by regions A, B, and C (col. 6, lines 38-49). Therefore, depending on the dynamic range of the input signal corresponding to respective portions of the image frame, a dynamic selection of particular ones of the plurality of digital transfer functions (regions A, B, and C) is provided.

Re claim 15, Tran discloses in figure 1 and imaging system (10) that is part of a video camera system (col. 3, lines 34-36). The imaging system (10) includes a sensor subsystem (12) that can include a CCD to provide a video output (col. 3, line 59 – col. 4, line 12). It is inherent that CCDs have a light-exposure-to-analog conversion dynamic range characteristic. An electrical image signal (22) received from the sensor subsystem (12) is sent to an A/D converter in order to convert the analog electrical image signal (22) outputted from the sensor subsystem (12) to a digital representation (col. 5, lines 1-9). The examiner takes Official Notice that it is well known in the art that A/D converters have an analog-to-digital conversion dynamic range and that the full analog dynamic range of the imaging device makes use of the full digital output word range of the A/D converter. It would have been obvious to one of ordinary skill in the art at the time of invention for the imaging system of Tran to include an A/D converter that includes an analog-to-digital conversion dynamic range and that the full analog dynamic range makes use of the full digital output word range of the A/D converter. Also, there

is no mention of making gamma corrections or non-linear enhancements before sending the image signal (22) to the A/D converter (col. 5, lines 1-9). Tran also states that digital values are modified within the subsystem (14) based on a gain profile that is stored in the subsystem (14) (col. 7, lines 7-10). The gain profile is selected to achieve a transfer function (fig. 6). A lookup table approach is used where each digital value input into the subsystem (14) is replaced by a value stored in a lookup table memory location corresponding to the digital value (col. 7, lines 10-15). Therefore, a lookup table is connected to convert digital video output words of the A/D converter and each word is converted according to one of the digital transfer functions of figure 6 corresponding to the different regions (A,B,C). The transfer function has three different regions (A,B,C) corresponding to a different input image intensity range (col. 6, lines 7-29). The three different regions of the transfer function can be treated as three different transfer functions. A low dynamic range input signal will be confined to region A of the transfer function, a medium dynamic range input signal will be processed by both region A and region B, and a high dynamic range input signal will be processed by regions A, B, and C (col. 6, lines 38-49). Therefore, depending on the dynamic range of the input signal corresponding to respective portions of the image frame, a dynamic selection of particular ones of the plurality of digital transfer functions (regions A, B, and C) is provided.

Claims 2-3 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Tran in view of Murata et al. US 5,325, 182.

Re claim 14, Tran includes all of the limitations of claim 13 above. Additionally, Tran states that the imaging system (10) includes a sensor subsystem (12) that can include a CCD to provide a video output (col. 3, line 59 – col. 4, line 12). However, Tran does not explicitly state that the plurality of digital transfer functions in the LUT each provide for a different dual-slope output conversion in which a first linear gain is applied to a zero-to-middle part of the dynamic range of the CCD, and a second linear gain is applied to a middle-to-full scale part of the dynamic range of the CCD.

Murata shows in figures 18 and19 an input/output characteristic of a knee correction. In figure 19, the input/output characteristic includes a zero-to-middle part with a single gain greater than one (fig. 19, before dashed line), and a middle-to-full part with a single gain less than one (fig. 19, after dashed line). In figure 18, the input/output characteristic includes a zero-to-middle part with a single gain less than one (fig. 18, before dashed line), and a middle-to-full part with a single gain greater than one (fig. 18, after dashed line). Therefore, it would have been obvious for one skilled in the art to have been motivated to include an I/O characteristic function as taught in Murata in the imaging system disclosed by Tran. Doing so would provide a means for applying diffent dual-slope output conversions in order to apply varying linear gains to the signal (Murata: figs. 18 and 19).

Re claim 2, Murata shows in figure 19 an input/output characteristic of a knee correction. The input/output characteristic includes a zero-to-middle part with a single

gain greater than one (fig. 19, before dashed line), and a middle-to-full part with a single gain less than one (fig. 19, after dashed line).

Re claim 3, Murata shows in figure 18 an input/output characteristic of a knee correction. The input/output characteristic includes a zero-to-middle part with a single gain less than one (fig. 18, before dashed line), and a middle-to-full part with a single gain greater than one (fig. 18, after dashed line).

Claims 5 and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Tran in view of Chaplin US 5,386,242.

Re claim 16, Tran includes all of the limitations of claim 15 above. However, Tran fails to specifically state that the transfer functions to be included in the lookup table may be downloaded or programmed.

Chaplin discloses a self keyer that utilizes a programmable transfer function stored in a lookup table in order to shape a background video (abstract). A multiplicative keyer (10) includes a PROM/RAM (24) capable of storing more than one transfer function (col. 3, lines 36-38). As a result a CPU may download different transfer functions to the PROM/RAM (24) (col. 3, lines 38-45; figs. 3-6). Therefore, it would have been obvious for one skilled in the art to have been motivated to include the PROM/RAM (24) capable of storing more than one transfer function and capable of downloading transfer functions through the use of a CPU in the imaging system

disclosed by Tran. Doing so would provide a means for storing more than one transfer function in a lookup table so that a CPU may download different transfer functions to the lookup table (col. 3, lines 38-45).

Re claim 5, Tran includes all of the limitations of claim 13 above. However, Tran fails to specifically state that the lookup table is programmable and downloadable.

Chaplin discloses a self keyer that utilizes a programmable transfer function stored in a lookup table in order to shape a background video (abstract). A multiplicative keyer (10) includes a PROM/RAM (24) capable of storing more than one transfer function (col. 3, lines 36-38). As a result a CPU may download different transfer functions to the PROM/RAM (24) (col. 3, lines 38-45; figs. 3-6). Therefore, it would have been obvious for one skilled in the art to have been motivated to include the PROM/RAM (24) capable of storing more than one transfer function and capable of downloading transfer functions through the use of a CPU in the imaging system disclosed by Tran. Doing so would provide a means for storing more than one transfer function in a lookup table so that a CPU may download different transfer functions to the lookup table (col. 3, lines 38-45).

Claim 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Tran in view of Kawa et al. US 6,002796.

Re claim 12, Tran includes all of the limitations of claim 13 above. However, Tran does not explicitly state that a multi-slope output conversion for each digital transfer function includes at least two knee-points that join three different linear digital gains.

Kawa shows in figure 3 a transform function in which the output video level varies according to several different rates with respect to the input video level (col. 3, lines 5-22). A multi-slope output conversion is shown that includes knee points (KP1 – KP9) that join different linear gains (figure 3). Therefore, it would have been obvious for one skilled in the art to have been motivated to include the transform function including multiple knee points and different linear gains as taught in Kawa in the imaging system disclosed by Tran. Doing so would provide a means for allocating the output video signal more efficiently (Kawa: col. 3, lines 26-30).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contacts

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly L. Jerabek whose telephone number is 703-305-8659. The examiner can normally be reached on Monday - Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone number for submitting all Official communications is 703-872-9306. The fax phone number for submitting informal communications such as drafts, proposed amendments, etc., may be faxed directly to the Examiner at 703-746-3059.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KLJ

WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600